

AD-A096 858

STATE UNIV OF NEW YORK AT STONY BROOK  
THE OBJECTIVITY AND SUBJECTIVITY OF LIFE EVENTS.(U)  
JAN 81 A A STONE

F/6 5/10

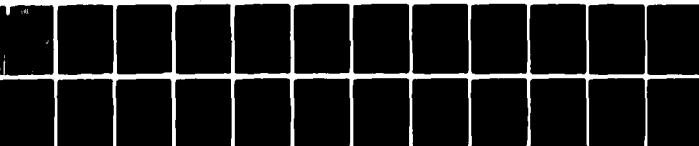
N00014-77-C-0693

UNCLASSIFIED

81-3

NL

1 of 1  
AD-A  
108884



END  
DATE  
FILMED  
4-81  
DTIC

✓  
-3  
**LEVEL II**

12

The Objectivity and Subjectivity of Life Events

Arthur A. Stone

Long Island Research Institute

and

Department of Psychiatry and Behavioral Science  
State University of New York at Stony Brook

AD A 096858

January 1981

Technical Report

DTIC  
ELECTE  
MAR 26 1981  
S D F

Approved for Public Release

Prepared for:

OFFICE OF NAVAL RESEARCH  
800 North Quincy Street  
Arlington, Virginia 22217

Reproduction in whole or in part is permitted for any purpose of the United States Government

**DISTRIBUTION STATEMENT A**

Approved for public release;  
Distribution Unlimited

81 3 25 047

| REPORT DOCUMENTATION PAGE   |                                     | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                                      |
|---|-------------------------------------|--|
| 1. REPORT NUMBER<br><b>(14)</b> 81-3  | 2. GOVT ACCESSION NO.<br>AD-A096858 | 3. RECIPIENT'S CATALOG NUMBER<br><b>(9)</b>                                      |
| 4. TITLE (and Subtitle)<br>The Objectivity and Subjectivity of Life Events.   |                                     | 5. TYPE OF REPORT & PERIOD COVERED<br>Technical Report                           |
| 6. AUTHOR<br><b>(6)</b> Arthur A. Stone   |                                     | 7. PERFORMING ORG. REPORT NUMBER<br>N7248-1-1                                    |
| <b>(10)</b>   |                                     | 8. CONTRACT OR GRANT NUMBER(s)<br>N00014-77-C-0693<br>N00014-79-C-0625           |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>L.I. Research Institute Dept. of Psychology<br>HSC-T-10 S.U.N.Y. at Stony Brook<br>Stony Brook, N.Y. 11794 Stony Brook, N.Y. 11794   |                                     | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS<br><b>(12)</b> 29 |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>Organizational Effectiveness Research Programs<br>Office of Naval Research (Code 452)<br>Arlington, VA 22217   |                                     | 12. REPORT DATE<br><b>(11)</b> Jan 1981  |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)   |                                     | 13. NUMBER OF PAGES<br>28  |
|   |                                     | 15. SECURITY CLASS. (of this report)<br>Unclassified                             |
|   |                                     | 15a. DECLASSIFICATION/DOWNGRADING<br>SCHEDULE                                    |
| 16. DISTRIBUTION STATEMENT (of this Report)<br><br>Approved for public release; distribution unlimited.   |                                     |  |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)  |                                     |  |
| 18. SUPPLEMENTARY NOTES   |                                     |  |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>Life events<br>Methodology<br>Objectivity<br>Subjectivity<br>Stress   |                                     |  |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>Life events have been considered objective or subjective depending on whether or not the events could be verified. This paper revises this concept (Verifiability) by requiring that the events actually be verified, and it presents two new types of objectivity-subjectivity of life events, Item Selection and Event Quantification. Three issues pertaining to the design of life event studies are presented and it is shown that these design issues interact with Verifiability and Event Quantification, sometimes resulting in |                                     |  |

DD FORM 1473

EDITION OF 1 NOV 65 IS OBSOLETE  
S/N C100-LE-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

256744

N.T.

studies with serious threats to their validity. It is recommended that all three types of objectivity-subjectivity be considered when designing life event studies.

The Objectivity and Subjectivity of Life Events

Arthur A. Stone

Long Island Research Institute

and

Department of Psychiatry and Behavioral Science  
S.U.N.Y. at Stony Brook

|                    |                                     |
|--------------------|-------------------------------------|
| Accession For      |                                     |
| PHS GRACI          | <input checked="" type="checkbox"/> |
| PHS TAB            | <input type="checkbox"/>            |
| Unannounced        | <input type="checkbox"/>            |
| Justification      |                                     |
| F.                 |                                     |
| Distribution/      |                                     |
| Availability Codes |                                     |
| Dist               | Avail and/or Special                |
| A                  |                                     |

Index terms: Life events, stress, objectivity, methodology

The Objectivity and Subjectivity of Life Events

In his classic text on stressful life events, B.P. Dohrenwend (1974) stated that the distinction between "objective" and "subjective" life event measurement had both "...theoretical and methodological importance" for exploring the stress-illness link. In this paper I will extend previous discussion of this distinction, examining its complexity and implications. In commenting on Holmes and Rahe's Social Readjustment Rating Scale (1967), Dohrenwend (1974) stated that "...each of the items on the checklist is an objective event in the sense that its existence theoretically and often practically can be verified independently of the respondent's report of its occurrence and independently of changes in the usual activities that it is likely to bring about" (p. 282, 1974). Subjective events were described as "...both theoretically and practically...difficult or impossible to verify independently of the respondents' reports of their occurrence" (p. 282, 1974). On closer examination it appears that some events that Dohrenwend would consider as objective are partly or primarily subjective; moreover, there are at least three different ways in which an index may be subjective, each of which has implications for study design and interpretation. To provide a framework for discussing the objectivity and subjectivity of life events, four major life event investigations will first be reviewed.

Out of their extensive experience with Adolf Meyer's Life Chart (1951), Holmes and Rahe (1967) developed the first life event inventory, the Social Readjustment Rating Scale (SRRS). They chose events which clustered around disease onset on the assumption that these events might be causally related to illness. The SRRS has 43 events that range over a wide variety of areas, from marriage to health. Because

the authors felt that most of the events required an adaptation from an individual's steady state and because they desired an accurate characterization of the degree of change required by each event, event weighting coefficients were constructed. The procedure for creating these weights was to have a group of subjects magnitude estimate all of the events according to the amount of adjustment required if the event were to occur; these weights which were used in subsequent studies. The Schedule of Recent Events (SRE) is a list of events without the ratings. Subjects indicate which events happened during a specified period, and by summing the weights of checked items a single number indicative of the degree of social readjustment required during the period is computed (the LCU score).

Another checklist, the Life Experiences Survey (LES), was developed by Sarason, Johnson and Siegel (1978). Most of the 47 events found on it were selected from existing instruments (72% from the SRRS). Additional events were generated to cover happenings that occur frequently and that might "...exert a significant impact on the lives of the persons experiencing them " (p. 934). In addition to checking events which occurred during a specified time period, respondents rate a combined desirability-impact scale for each of the checked events. These ratings were obtained every time the checklist was used. The scale anchors range from extremely negative to no impact to extremely positive along a single 7-point dimension.

The Psychiatric Epidemiology Research Interview (PERI) was developed by Dohrenwend, Krasnoff, Askenasy, and Dohrenwend (1978). They created their checklist by asking subjects "What was the last major event in your life that, for better or for worse, interrupted or changed your usual activities?" One hundred and two events were compiled and each was classified by four judges according to its presumed probability of occurrence in various sociocultural settings: whether it was a

gain, loss, or ambiguous; its independence of psychiatric and physical conditions; and, its central figure (self or someone else). A much larger sample of judges magnitude estimated the social readjustment inherent in each event. These ratings were analyzed to determine the proportion of event rating variance which fell into each of three components: universal agreement (all people rated the event in the same way); differences due to social class or other demographic characteristics; and, differences that were unrelated to the previous two classes (considered as error). These proportions were used to classify event ratings as either universally stable, stable within specific sub-groups, or unstable with regard to the aforementioned characteristics.

The last event inventory which we will consider, the Interview Schedule for Events and Difficulties (ISED), varies from the previous instruments in that it is a semi-structured, standardized interview rather than a self-report questionnaire. Brown and his colleagues (see Brown and Harris, 1978) developed the interview to record events which were encountered by their subjects during the last several months. The interview touches on several content areas including health, role changes, leisure, employment, housing, and money. Open-ended questions are used first to solicit information in each content area; specific probes follow-up areas in which there were positive responses. With the help of tape recordings, interviewers rate each event recorded on 28 scales. A partial listing of the rating scales are: the focus of the event (the subject or someone/something else); the degree of emotional preparation for the event; immediate positive feeling; short-term threat or unpleasantness; and, reported positive support during the event. Ratings, then, were a combination of the subject's reaction to the events and the interviewers' impression of the subject's reactions: "...ratings were, therefore, always based on what we were told but occasionally went beyond this to rate what most women would probably have



experienced in similar encounters" (p. 87, Brown & Harris, 1978). Indices of "contextual threat" were also derived for each event by having the interviewer read an account of the event and the circumstances surrounding its occurrence to Brown's research team. Team members were "blind" regarding the subjective reaction to the event and the mental, physical, and social status of the person experiencing it. The members of the team independently rated the degree of short-term (immediate) and long-term (one week) threat that they believed was inherent in the situation given its context.

Ways in Which Life Events Can Be Objective and Subjective. There are several ways in which checklist and interview methods for obtaining life event experience can be objective or subjective. Dohrenwend's definition focussed on whether or not events can be verified (Verifiability). But there are additional criteria which can be used. One deals with the method by which event indices are created, with subjective weighting coefficients or objective categories (Event Quantification). There is also the matter of how events are chosen, with either subjective or objective criteria (Item Selection). The rest of this paper will discuss these distinctions.

Objectivity-subjectivity defined by actual confirmation of event occurrence versus subjective responses defines the first kind of objectivity and will be called Verifiability. According to Dohrenwend's definitions of objectivity and subjectivity, the SRRS events and many of the LES and PERI events are, in principle, verifiable. However, some of the non-SRRS events included on the LES (for example, the items "reconciliation with boyfriend/girlfriend," and "sexual difficulties") would be hard to verify. Because there is no standardized event schedule for the ISED, it is more difficult to evaluate how the events fare according to Dohrenwend's verifiability criterion. Since the content of an interview varies from person to person, an

evaluation of the verifiability of a particular set of events from a few interviews might not apply to other interviews because other subjects could generate a very different set of events. Nonetheless, many of the events that Brown reports appear to be verifiable. Responses to some of the interviewers' queries, however, such as "...have you any relatives who are a worry to you for other reasons?" "Have you ever considered marriage?" "Do you enjoy your job?" "Do you like living in your present house/flat?" and "Do you feel it private enough?" would not be considered verifiable since they rely solely on individuals' opinions.

By Dohrenwend's definition of objectivity, then, the life events collected in the four studies, with perhaps the exception of the ISED, are generally objective: in theory the events are verifiable. But what about in practice? Of these studies, only Brown's group reports that they attempted verification of the reported events; the interview format lent itself to getting the information necessary for this, that is, names of those who could corroborate subjects' reports. We do not know, though, what proportion of the total number of events were verified. Thus, in practice events often go unverified and may better be considered subjective because it is unclear whether or not they actually happened. This paper's definition of objectivity-subjectivity based on event verification goes beyond Dohrenwend's definition in that it requires the event not only to be theoretically verifiable, but to actually be verified.

The second kind of objectivity-subjectivity concerns how event checklist responses are transformed into numerical measures and this is called Event Quantification. The social readjustment ratings of the SRRS, the desirability-impact ratings of the LES, and the readjustment ratings of the PERI all yield subjective indices of life events since they rely on subjective responses of the individual or group that rated the events. The procedure for creating event indices with the ISED

combines the reaction of the respondent and the reaction of the interviewer to the respondents' descriptions of the events and both reactions are subjective. ISED contextual threat ratings are conceptually similar to the SRRS ratings scheme inasmuch as event ratings from a reference group (Brown's small group of "experts") are applied to the events that were experienced by other individuals. Although not stated explicitly, the spirit of the ISED scheme would require that two subjects with identical events and contexts receive the same contextual threat score. Procedurally, contextual threat and social readjustment weighting coefficients differ in that the former are specified in greater detail, namely, by context, age of subject, etc. than the latter which are applied solely on the basis of which events are checked on the SRE. Thus, all of the weighting methods reviewed were subjective.

Note that how event weightings were obtained, from a reference group (as with the SRRS) or from the person who experienced the event (as with the LES), does not change the objective-subjective status of the index because both sets of ratings rely on subjective responses. Furthermore, objective event ratings with relatively little observed variability, for example, death of a spouse, are no more objective than minor events with much intersubject variation with regard to Event Quantification. Because most people have a similar reaction to a major event does not mean that certain people in particular circumstances will have the same reaction. The scores may be less variable, but are still subjective.

This is not to say that all means of classifying events are subjective. An alternate means of classification is to place events into clearly defined content areas which are not based on subjective reactions. Classification according to family, work, leisure, or other life areas (e.g., Chiriboga and Dean, 1978; Ruch, 1977) depends mainly on an event's content and not subjective reactions to it. One way which this

could be done is to give a score to each content classification by summing, for example, the number of items checked in each category.

The third kind of objectivity, Item Selection, concerns the way in which events were selected for life event checklists. To illustrate this, imagine an event index which is based simply on the sum of checked events. Because there are no event weightings, it may appear that this kind of index is free of any subjectivity. But subjectivity enters into checklist scores whenever the criterion used to select the events was itself subjective. Suppose an investigator desires to have an event checklist of losses to determine if people who experience them are more prone to depression. To construct the list, a sample of subjects are asked to list "losses" they have encountered in the last five years and a checklist is compiled from these responses. The investigator decides to index the concept of loss by using the frequency of loss events recorded during some period of time. If the study's participants view the events as losses, all is well: the score on the checklist represents the intended concept. On the other hand, if the subjects do not view most of the events as losses, a strong association between checklist scores and depression may not be due to the experience of loss but due to some other, unmeasured attribute of the events. This problem arises because the construct loss is not an inherent quality of an event. Thus, scores formed by summing occurrences on checklists whose items were chosen with subjective criteria, such as loss, are themselves in a sense subjective indices.

As in the above example, Item Selection has its most problematic effect when the investigator chooses the events with some subjective concept and uses a simple total of checked events to index it. None of the four life events' recording methods discussed earlier used this method. The SRRS events were chosen with an empirical

criterion, that of events clustering around the time of illness onset, and the concept of social readjustment was an emergent property of the events after they were collected. The other studies chose events because they were significant in some way. They had subjects rate the degree of readjustment, change, etc.: the events themselves were not chosen because they were "changing." Clearly, the simplest way to avoid Item Selection subjectivity is by not using a subjective criterion for event selection. A relatively objective method for recording events is to record everything that happens to an individual, as Barker and Wright (1951) did with one child for a single day.

Some Life Event Study Design Issues Which Relate To Event Objectivity-Subjectivity. Before we can discuss the impact of these distinctions on life events research, three life event study design issues must be discussed: the reasons for undertaking a study in the first place; the degree to which event content overlaps with the outcome variable; and, whether the methodology used in the study is retrospective or prospective.

A primary distinction between studies in the life events area is whether the intent is forecasting an outcome (Prediction Study) or revealing the underlying causal network leading to changes in the outcome (Causal Study). This classification is useful because it suggests differences in the appropriateness of methodologies, methods of analysis, and interpretation for each kind of study. Predictive studies attempt to optimize the prediction of the outcome from a number of variables. It is of no consequence that these predictors themselves may be caused by some more "basic" unmeasured variables; what matters is only whether the predictors are reliably related to the outcome (see Cook & Campbell, 1979). Statistical methods such as step-wise multiple regression are often employed in prediction studies. On the other

hand, causal studies, although also interested in prediction, focus heavily on the interrelationships among the predictor variables. Priorities are assigned to the predictors on a priori grounds (for instance, based on the temporal relationships among variables) and analytical methods such as path analysis are used to untangle the relationships among the variables.

The degree to which the content of life events overlaps with an outcome measure is another quality of life events studies. Dohrenwend (1974) and Fairbank and Hough (1979) have developed the concept and labeled it Event Independence. Briefly, Dohrenwend (1974) describes three populations of events. The first two populations include events which could be produced by or be concomitants of the outcome under study, usually a physical or psychiatric illness. For example, the event "trouble with sleep" is a possible symptom of depression and falls into Dohrenwend's classification of events confounded with psychiatric illness: such events are called dependent (on the outcome) here. The third event category is composed of events which are likely to be independent of illness. Natural catastrophes such as floods and earthquakes fall into this category as do some of the major events found on the SRE, LES, and PERI, for example, death of spouse. Using events confounded with a study's outcome measure threatens the validity of any cause and effect statements because the presumed cause (events) may simply be another way of measuring the effect (outcome).

The third study design issue concerns whether data were collected retrospectively or prospectively. Retrospective life event studies rely on peoples' reports of past events; in some studies, subjects are asked to report events that occurred within the previous year. Studies which retrospectively assess life events and wait some period before assessing the outcome (and therefore have a prospective

component) are viewed here as retrospective because they retain many of the biases inherent in the retrospective method. For example, simple forgetting or more complex distortions of memory may affect recall of events which occurred some time ago. Furthermore, the distortions may produce an event-outcome relationship, as in what Brown (1974) has called "effort after meaning." On the other hand, prospective life event studies collect event data prior to the time the illness is evident and only use reports of very recent events.

The Relationship Between the Objectivity-Subjectivity Distinctions and Study Design Issues. The reason for distinguishing between forecasting and causal studies, event independence, and retrospective versus prospective designs is because the way in which event objectivity-subjectivity affects a study is dependent upon how the study fares on these characteristics. Actually, only two of the three types of objectivity, Verifiability and Event Quantification, interact with the study design issues producing various problems for certain designs. Before moving on to the implications of combinations of these characteristics, a general point needs to be made about Item Selection. Item Selection affects what Cook & Campbell (1979) have called construct validity, the degree to which a construct generalizes to other studies in other settings on other occasions. Events selected on subjective criteria, such as loss in the previous example, are not valid if another subject sample does not view the events as losses. A large number of checks on such a questionnaire may not indicate a large degree of psychological loss. On the other hand, objective event selection, which is not necessarily intended to represent a particular subjective construct, does not have this validity problem.

The remaining two types of objectivity-subjectivity, Verifiability and Event Quantification, do interact with the study design issues (predictor versus causal study;

event independence; retrospective versus prospective design). Since each of the design issues are dichotomies, e.g., a study is either retrospective or prospective, there are eight distinct combinations ( $2^3$ ) are possible (See Table 1). The four life event studies reviewed earlier were retrospective, were exploring causal relationships among life events and various outcomes, and used independent events (this was not true for the early SRRS studies, but the later studies selected only independent events from the checklist); thus, they were all of design type IV. I will consider several of the eight designs during the discussion of Verifiability and Event Quantification. Two designs (III and VII) will not be considered at all because they have such serious threats to their validity. Designs III and VII both attempt to explore causal relationships with dependent events which, as mentioned in the discussion of event independence, is impossible to do since dependent events confound the predictor with outcome. -

Turning to the objective-subjective distinction of Verifiability, verified events (objective on Verifiability) present no threats to the validity of the six remaining designs. On the other hand, nonverified events (subjective on Verifiability) threaten the validity of the retrospective designs (I,II,IV). There two reasons for this: the first is inaccurate recall of events caused by simple forgetting over the long time periods (several months) which subjects report on. Recent studies by Jenkins et al. (1979) and Uhlenhuth et al. (1977) attest to the declining number of events remembered during the past several months. The second reason concerns another type of inaccurate recall which may also have an effect on the study's validity. "Effort after meaning" (Brown, 1974) posits that new information can affect the remembrance of older information. For example, knowledge that one has just contracted an illness (new information) may cause an individual to look back to events which occurred just before the illness (old information) and report them, when ordinarily the events wouldn't have been reported at all.



Clearly, causal, retrospective studies (IV) are seriously compromised by inaccurate recall of either type, but predictive, retrospective studies (I,II) are compromised as well. This is because a researcher doing a predictive study would like to draw conclusions such as "If a person reports N number of events prior to illness report, then there is such and such a chance of the person reporting illness later on." If the study did not yield an accurate estimate of how many events would be reported prior to illness (and this bias would probably be to report fewer events), a statement such as the one mentioned above could well be inaccurate. Prospective studies greatly reduce the problems associated with nonverified events. Effects due to poor recall of events are diminished because the life event measurement period is not be several months long. Effort after meaning is eliminated because the events are recorded prior to the outcome's emergence. Thus, designs V,VI, and VIII are not seriously threatened by nonverified events.

On the remaining objective-subjective distinction, Event Quantification, subjective weightings are generally more problematical for life event studies' validity than an objective manner of quantifying events (e.g., classification by event content). As was mentioned earlier, there are two ways in which investigators have applied subjective weightings. The group method involves applying event weights obtained from a single group to event reports of other subjects: the SRRS/SRE and PERI methodologies exemplify this method. The personal method involves individuals assigning weights to the events they report: the LES exemplifies this method.

Personal weights used in retrospective studies (I,II,IV), that is, weights which are assigned after the outcome has occurred, are prone to the same "effort after meaning" and simple recall biases that were mentioned earlier, resulting in studies

which have serious threats to their validity. However, if personal weights are used with prospective designs (V,VI,VIII), the recall bias is greatly reduced. Group weightings are not affected by recall bias since they are predetermined; thus, they may be used with both retrospective and prospective designs. There are nonetheless many problems pertaining to the accuracy of group weightings. For example, because there is much variability around the mean of event weightings, the weights do not truly reflect the opinions of the people experiencing them (Dohrenwend et al., 1978; Wershow & Reinhart, 1974). But this is not the issue at hand here; our concern is whether or not the subjective weighting techniques, and not the weightings themselves, are objectionable.

Studies which use classification by content (objective on Event Quantification) are not affected by recall biases since they are not subjective. Whether the design of the study is retrospective or prospective is of no consequence to the validity of classifications. Likewise, whether a study is predictive or causal does not affect validity. Thus, this weighting technique does not threaten the validity of any of the studies. It should be evident, though, that very different sorts of hypotheses are addressed with objectively versus subjectively weighted events: an investigator misses the wealth of information contained in subjective weightings (expressed as individual differences) when objective classification is used exclusively.

The life event studies which were reviewed earlier were all of design type IV. We have now seen that this design has problems on the Verifiability distinction because of the biases in recalling events. Likewise, on the Event Quantification distinction, one of the four studies used personal weighting (the LES) which is also a problem with design IV. The point of discussing these problems in context of the three objective-subjective characterizations is not to belabor the weaknesses of the

studies, but only to demonstrate the utility of reviewing studies with regard to the new objectivity and subjectivity distinctions.

In conclusion, this discussion supports Dehnenwend's sentiment which began the paper: the objective-subjective distinction is important in the evaluation of life event studies. Three types of objectivity-subjectivity were explicated. Two of the distinctions were shown to interact with three life event study design issues resulting in various threats to the studies' validity. Neither objective nor subjective events uniformly yield studies without serious threats to their validity. We suggest that in the future, investigators plan their life event studies with the three objectivity-subjectivity distinctions in mind.

### References

- Barker, R.G. & Wright, H.F. One boy's day. New York: Harper & Row, 1951.
- Brown, G.W. & Harris, T. Social origin of depression: A study of psychiatric disorder in women. New York: Free Press, 1978.
- Chiriboga, D.A. & Dean, H. Dimensions of stress: Perspectives from a longitudinal study. Journal of Psychosomatic Research, 1978, 19, 47-55.
- Cook, T.D. & Campbell, D.T. Quasi-experimentation: Design and analysis issues for field settings. Chicago: Rand McNally, 1979.
- Dohrenwend, B.P. Problems in defining and sampling the relevant population of stressful life events. In B.S. Dohrenwend & B.P. Dohrenwend (Eds.), Stressful life events: Their nature and effects. New York: John Wiley, 1974.
- Dohrenwend, B.S., Krasnoff, L., Askenasy, A.R. & Dohrenwend, B.P. Exemplification of a method for scaling life events: The PERI life events scale. Journal of Health and Social Behavior, 1978, 19, 205-229.
- Fairbank, D.T. & Hough, R.L. Life event classifications and the event-illness relationship. Journal of Human Stress, 1979, 5, 41-47.
- Holmes, T.H. & Rahe, R.H. The social readjustment rating scale. Journal of Psychosomatic Research, 1967, 11, 213-218.
- Jenkins, C.D., Hurst, M.W. & Rose, R.M. Life changes. Do people really remember? Archives of General Psychiatry, 1979, 36, 379-384.
- Meyer, A. The life chart and the obligation of specifying positive data in psychopathological diagnosis. In E.E. Winters (Ed.), The Collected Papers of Adolf Meyer. Volume III. Medical Teaching. Baltimore: Md.: John Hopkins University Press, 1951.
- Ruch, L.O. A multidimensional analysis of the concept of life change. Journal of Health and Social Behavior, 1977, 18, 71-83.
- Sarason, I.G., Johnson, J.H. & Siegel, J.M. Assessing the impact of life changes: Development of the life experiences survey. Journal of Consulting and Clinical Psychology, 1978, 46, 932-946.
- Wershow, H.J. & Reinhart, G. Life change and hospitalization -- A heretical view. Journal of Psychosomatic Research, 1974, 18, 393-401.
- Unterhuth, E., Balter, M., Lipman, R.S. & Haberman, S.J. Remembering life events. In Strauss, J., Babigian, H.M. & Roff, M. (Eds.), The origins and course of psychopathology: Methods of longitudinal research. New York: Plenum, 1977.

Footnote

The author gratefully acknowledges the helpful comments of Drs. John M. Neale and Maurice S. Satin on early drafts of the manuscript. This work was supported by the Office of Naval Research and the National Science Foundation. Reprint requests should be sent to Long Island Research Institute, H.S.C. T-10, S.U.N.Y. at Stony Brook, Stony Brook, New York, 11974.

Table 1  
Eight Possible Designs  
Formed By the Study Design Issues

| <u>Study</u> | <u>Design</u>  |             |                    |
|--------------|----------------|-------------|--------------------|
| I            | Retrospective, | Predictive, | Dependent Events   |
| II           | Retrospective, | Predictive, | Independent Events |
| III          | Retrospective, | Causal,     | Dependent Events   |
| IV           | Retrospective, | Causal,     | Independent Events |
| V            | Prospective,   | Predictive, | Dependent Events   |
| VI           | Prospective,   | Predictive, | Independent Events |
| VII          | Prospective,   | Causal,     | Dependent Events   |
| VIII         | Prospective,   | Causal,     | Independent Events |

Manpower R&D Program - Distribution of Technical Reports

Part I - Mandatory

|  |   |
|--|---|
| Manager, Program in Manpower R&D (12 copies)<br>Code 450<br>Office of Naval Research<br>Arlington, Virginia 22217  | Director, Research & Analysis Division<br>Plans & Policy Department<br>Navy Recruiting Command (Code 22)<br>4015 Wilson Boulevard<br>Arlington, Virginia 22203                        |
| Head, Manpower, Personnel, Training<br>and Reserves Team (Op-954D)<br>Office of the Chief of Naval Operations<br>44578, The Pentagon<br>Washington, D. C. 20350                          | Military Assistant for Training &<br>Personnel Technology<br>Office of the Under Secretary of Defense<br>for Research & Engineering<br>3D129, The Pentagon<br>Washington, D. C. 20301 |
| Assistant for Personnel Logistics<br>Planning<br>Office of the CNO (Op-987P10)<br>5D772, The Pentagon<br>Washington, D. C. 20350   | Personnel Analysis Division<br>AF/MPXA<br>5C360, The Pentagon<br>Washington, D. C. 20330  |
| Scientific Advisor to the Deputy Chief<br>of Naval Operations (Manpower,<br>Personnel & Training)<br>Office of the DCNO(MPT) (Op-01T)<br>2705 Arlington Annex<br>Washington, D. C. 20350 | Technical Director<br>U.S. Army Institute for the Behavioral<br>& Social Sciences<br>5001 Eisenhower Avenue<br>Alexandria, Virginia 22333   |
| Head, Research, Development, & Studies<br>Branch<br>Office of the DCNO(MPT) (Op-102)<br>1812 Arlington Annex<br>Washington, D. C. 20350  | Program Director<br>Manpower Research & Advisory Services<br>Smithsonian Institution<br>801 North Pitt Street<br>Alexandria, Virginia 22314   |
| Program Administrator for Manpower,<br>Personnel, & Training<br>HQ Naval Material Command (Code 08D22)<br>678 Crystal Plaza #5<br>Washington, D. C. 20360                                |   |
| Director, Decision Support Systems<br>Branch<br>Naval Military Personnel Command<br>(N-154)<br>1818 Arlington Annex<br>Washington, D. C. 20370   |   |
| Head, Evaluation Section<br>Naval Military Personnel Command<br>(N-60)<br>Department of the Navy<br>Washington, D. C. 20370  |   |

LIST 1  
MANDATORY

Defense Documentation Center (12 copies)  
ATTN: EDC-70  
Accessions Division  
Cameron Station  
Alexandria, Virginia 22314

Library of Congress  
Science & Technology Division  
Washington, D. C. 20540

Chief of Naval Research (3 copies)  
Office of Naval Research (Code 452)  
800 North Quincy Street  
Arlington, Virginia 22217

Commanding Officer (6 copies)  
Naval Research Laboratory  
Code 2627  
Washington, D. C. 20375

LIST 2  
ONR FIELD

Commanding Officer  
ONR Branch Office  
1030 East Green Street  
Pasadena, California 91106

Psychologist  
ONR Branch Office  
1030 East Green Street  
Pasadena, California 91106

Commanding Officer  
ONR Branch Office  
536 South Clark Street  
Chicago, Illinois 60605

Psychologist  
ONR Branch Office  
536 South Clark Street  
Chicago, Illinois 60605

Commanding Officer  
ONR Branch Office  
Building 114, Section D  
666 Summer Street  
Boston, Massachusetts 02210

Psychologist  
ONR Branch Office  
Building 114, Section D  
666 Summer Street  
Boston, Massachusetts 02210

Office of Naval Research  
Director, Technology Programs  
Code 200  
800 North Quincy Street  
Arlington, Virginia 22217

LIST 4  
NAVJAT & NPRDC

NAVJAT

Naval Material Command  
Program Administrator, Manpower, Personnel  
& Training (Code CST244)  
1044 Crystal Plaza #5  
Washington, D. C. 20360

Naval Material Command  
Management Training Center  
NAVJAT 09432  
Jefferson Plaza, Bldg. 2, Room 18C  
1421 Jefferson Davis Highway  
Arlington, Virginia 20360

NPRDC

Commanding Officer (5 copies)  
Naval Personnel R&D Center  
San Diego, California 92162

Navy Personnel R&D Center  
Washington Liaison Office  
Building 200, 2N  
Washington Navy Yard  
Washington, D. C. 20374



# LIST 5

## BUMED

Commanding Officer  
Naval Health Research Center  
San Diego, California

Commanding Officer  
Naval Submarine Medical Research  
Laboratory,  
Naval Submarine Base  
New London, Box 900  
Groton, Connecticut 06340

Director, Medical Service Corps  
Bureau of Medicine & Surgery (Code 23)  
Department of the Navy  
Washington, D. C. 20372

Naval Aerospace Medical Research Lab  
Naval Air Station  
Pensacola, Florida 32508

CDR Robert Kennedy,  
Officer in Charge  
Naval Aerospace Medical Research  
Laboratory Detachment  
Box 2940, Michoud Station  
New Orleans, Louisiana 70129

National Naval Medical Center  
Psychology Department  
Bethesda, Maryland 20014

Commanding Officer  
Navy Medical R&D Command  
Bethesda, Maryland 20014

# LIST 6

## NAVAL POSTGRADUATE SCHOOL

Naval Postgraduate School  
ATTN: Dr. Richard S. Elster  
Department of Administrative Sciences  
Monterey, California 93940

Naval Postgraduate School  
ATTN: Professor John Senger  
Operations Research & Administrative  
Science  
Monterey, California 93940

Superintendent  
Naval Postgraduate School  
Code 1424  
Monterey, California 93940

# LIST 7

## HRM

Officer in Charge  
Human Resource Management Detachment  
Naval Air Station  
Alameda, California 94581

Officer in Charge  
Human Resource Management Detachment  
Naval Submarine Base New London  
P.O. Box 8  
Groton, Connecticut 06340

Officer in Charge  
Human Resource Management Division  
Naval Air Station  
Mayport, Florida 32118

Commanding Officer  
Human Resource Management Center  
Pearl Harbor, Hawaii 96860

LIST 7 continued

Commander in Chief  
Human Resource Management Division  
U.S. Pacific Fleet  
Pearl Harbor, Hawaii 96860

Officer in Charge  
Human Resource Management Detachment  
Naval Base  
Charleston, South Carolina 29408

Commanding Officer  
Human Resource Management School  
Naval Air Station Memphis  
Millington, Tennessee 38054

Human Resource Management School  
Naval Air Station Memphis (96)  
Millington, Tennessee 38054

Commanding Officer  
Human Resource Management Center  
1300 Wilson Boulevard  
Arlington, Virginia 22209

Commanding Officer  
Human Resource Management Center  
5621-23 Tidewater Drive  
Norfolk, Virginia 23511

Commander in Chief  
Human Resource Management Division  
U.S. Atlantic Fleet  
Norfolk, Virginia 23511

Officer in Charge  
Human Resource Management Detachment  
Naval Air Station Whidbey Island  
Oak Harbor, Washington 98278

Commanding Officer  
Human Resource Management Center  
Box 23  
FPO New York 09510

Commander in Chief  
Human Resource Management Division  
U.S. Naval Force Europe  
FPO New York 09510

Officer in Charge  
Human Resource Management Detachment  
Box 60  
FPO San Francisco 96651

Officer in Charge  
Human Resource Management Detachment  
COMNAVFORJAPAN  
FPO Seattle 98762

LIST 8

NAVY MISCELLANEOUS

Naval Amphibious School  
Director, Human Resource Training  
Department  
Naval Amphibious Base  
Little Creek  
Norfolk, Virginia 23521

Chief of Naval Education & Training (N-5)  
ACOS Research & Program Development  
Naval Air Station  
Pensacola, Florida 32508

Naval Military Personnel Command (2 copies)  
HRM Department (HMPC-6)  
Washington, D. C. 20350

Navy Recruiting Command  
Head, Research & Analysis Branch  
Code 434, Room 8001  
801 North Randolph Street  
Arlington, Virginia 22203

Chief of Naval Technical Training  
ATTN: Dr. Norman Kerr, Code 0161  
NAS Memphis (75)  
Millington, Tennessee 38054

Naval Training Analysis & Evaluation  
Group  
Orlando, Florida 32813

Commanding Officer  
Naval Training Equipment Center  
Orlando, Florida 32813

Naval War College  
Management Department  
Newport, Rhode Island 02840

LIST 9

USMC

Commandant of the Marine Corps  
Headquarters, U.S. Marine Corps  
Code MFI-20  
Washington, D. C. 20380

Headquarters, U.S. Marine Corps  
ATTN: Dr. A. L. Stafkosky  
Code RD-1  
Washington, D. C. 20380

LIST 11

OTHER FEDERAL GOVERNMENT

National Institute of Education  
Educational Equity Grants Program  
1200 19th Street, NW  
Washington, D. C. 20208

Office of Personnel Management  
Organizational Psychology Branch  
1900 E Street, NW  
Washington, D. C. 20415

National Institute of Education  
ATTN: Dr. Fritz Muhlhauser  
EGLC/SMO  
1200 19th Street, NW  
Washington, D. C. 20208

Chief, Psychological Research Branch  
ATTN: Mr. Richard Lanterman  
U.S. Coast Guard (S-P-1/2/62)  
Washington, D. C. 20590

National Institute of Mental Health  
Minority Group Mental Health Programs  
Room 7 - 102  
5600 Fishers Lane  
Rockville, Maryland 20852

Social & Developmental Psychology  
Program  
National Science Foundation  
Washington, D. C. 20550

LIST 12

ARMY

Army Research Institute  
Field Unit - Monterey  
P.O. Box 5787  
Monterey, California 93940

Army Research Institute  
Field Unit - Leavenworth  
P.O. Box 3122  
Fort Leavenworth, Kansas 66027

Deputy Chief of Staff for Personnel,  
Research Office  
ATTN: DAPE-PBR  
Washington, D. C. 20310

Technical Director (2 copies)  
Army Research Institute  
5001 Eisenhower Avenue  
Alexandria, Virginia 22304

Headquarters, FORSCOM  
ATTN: AFPR-HR  
Ft. McPherson, Georgia 30330

LIST 13  
AIR FORCE

Air University Library/LSE 76-443  
Maxwell AFB, Alabama 36112

AFOSE/NL (Dr. Fregly)  
Building 410  
Bolling AFB  
Washington, D. C. 20332

Air Force Institute of Technology  
AFIT/LSGR (Lt. Col. Umstot)  
Wright-Patterson AFB  
Dayton, Ohio 45433

Technical Director  
AFHRL/ORS  
Brooks AFB  
San Antonio, Texas 78235

AFMPC/DPMYP  
(Research & Measurement Division)  
Randolph AFB  
Universal City, Texas 78148

LIST 14  
MISCELLANEOUS

Dr. Edwin A. Fleishman  
Advanced Research Resources Organization  
Suite 900  
433 East West Highway  
Washington, D. C. 20014

Australian Embassy  
Office of the Air Attache (S35)  
1601 Massachusetts Avenue, NW  
Washington, D. C. 20036

British Embassy  
Scientific Information Officer  
Room 509  
3100 Massachusetts Avenue, NW  
Washington, D. C. 20008

Canadian Defense Liaison Staff, Washington  
ATTN: CDRD  
2450 Massachusetts Avenue, NW  
Washington, D. C. 20008

Mr. Mark T. Munger  
McBer & Company  
137 Newbury Street  
Boston, Massachusetts 02116

HumRRO  
ATTN: Library  
300 North Washington Street  
Alexandria, Virginia 22314

Mr. Luigi Petrullo  
2431 North Edgewood Street  
Arlington, Virginia 22207

Commandant, Royal Military College  
of Canada  
ATTN: Department of Military  
Leadership & Management  
Kingston, Ontario K7L 2W3  
Canada

National Defense Headquarters  
ATTN: DEAR  
Ottawa, Ontario K1A 0A2  
Canada

LIST 15  
CURRENT CONTRACTORS

Dr. Clayton P. Alderfer  
School of Organization & Management  
Yale University  
New Haven, Connecticut 06520

Dr. W. Russell Bernard  
Department of Sociology & Anthrop  
West Virginia University  
Morgantown, West Virginia 26506

LIST 15 continued

Dr. Arthur Blaiwes  
Human Factors Laboratory, Code N-71  
Naval Training Equipment Center  
Orlando, Florida 32813

Dr. Michael Borus  
Ohio State University  
Columbus, Ohio 43210

Dr. Joseph V. Brady  
Johns Hopkins University School of  
Medicine  
Division of Behavioral Biology  
Baltimore, Maryland 21205

Mr. Frank Clark  
ADTECH/Advanced Technology, Inc.  
7923 Jones Branch Drive, Suite 500  
McLean, Virginia 22102

Dr. Stuart W. Cook  
Institute of Behavioral Sciences  
University of Colorado  
Boulder, Colorado 80309

Mr. Gerald M. Croan  
Westinghouse National Issues Center  
Suite 1111  
2341 Jefferson Davis Highway  
Arlington, Virginia 22202

Dr. Larry Cummings  
Center for the Study of Organizational  
Performance  
Graduate School of Business  
University of Wisconsin - Madison  
1155 Observatory Drive  
Madison, Wisconsin 53706

Dr. John P. French, Jr.  
Institute for Social Research  
University of Michigan  
P.O. Box 1248  
Ann Arbor, Michigan 48106

Dr. Paul S. Goodman  
Graduate School of Industrial  
Administration  
Carnegie-Mellon University  
Pittsburgh, Pennsylvania 15213

Dr. J. Richard Hackman  
School of Organization & Management  
Yale University  
33 Hillhouse Avenue  
New Haven, Connecticut 06520

Dr. Asa G. Hilliard, Jr.  
Urban Institute for Human Services, Inc.  
P.O. Box 15068  
San Francisco, California 94115

Dr. Charles L. Hulin  
Department of Psychology  
University of Illinois  
Champaign, Illinois 61820

Dr. Edna J. Hunter  
United States International University  
School of Human Behavior  
P.O. Box 26110  
San Diego, California 92126

Dr. Rudi Klauss  
Syracuse University  
Public Administration Department  
Maxwell School  
Syracuse, New York 13210

Dr. Judi Komaki  
Georgia Institute of Technology  
Engineering Experiment Station  
Atlanta, Georgia 30332

Dr. Edward E. Lawler  
Battelle Human Affairs Research Centers  
P.O. Box 5395  
4000 NE 41st Street  
Seattle, Washington 98105

Dr. Edwin A. Locke  
University of Maryland  
College of Business & Management &  
Department of Psychology  
College Park, Maryland 20742

Dr. Ben Morgan  
Performance Assessment Laboratory  
Old Dominion University  
Norfolk, Virginia 23508

Dr. Richard T. Mowday  
Graduate School of Management & Business  
University of Oregon  
Eugene, Oregon 97403

Dr. Joseph Oinstead  
Human Resources Research Organization  
300 North Washington Street  
Alexandria, Virginia 22314

LIST 15 continued

Dr. Thomas M. Ostrom  
Department of Psychology  
116 East Stadium  
Ohio State University  
4040 West 17th Avenue  
Columbus, Ohio 43210

Dr. George E. Rowland  
Temple University, Merit Center  
Ritter Annex, 9th Floor  
College of Education  
Philadelphia, Pennsylvania 19122

Dr. Benjamin Schneider  
Michigan State University  
East Lansing, Michigan 48824

Dr. Saul B. Sells  
Institute of Behavioral Research  
Texas Christian University  
Drawer C  
Fort Worth, Texas 76129

Dr. H. Wallace Sinaiko  
Program Director, Manpower Research  
Advisory Services  
Smithsonian Institution  
801 North Pitt Street, Suite 120  
Alexandria, Virginia 22314

Dr. Richard Steers  
Graduate School of Management & Business  
University of Oregon  
Eugene, Oregon 97403